PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Improvements relating to the Sowing of Seeds

We, NATIONAL RESEARCH DEVELOPMENT CORPORATION, a Company registered under the Laws of Great Britain, of P.O. Box 236, Kinsgate House, 66-74, Victoria Street, London, S.W.1., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the sowing of seeds and is concerned in particular with compositions incorporating seeds and with machines for sowing seeds.

One object of the invention is to facilitate the uniform sowing of seeds, more particularly where it is desirable not to disturb the ground more than is necessary.

According to one aspect of the invention a composition of matter includes seeds which remain disseminated through a fluid matrix whether the matrix is stationary or in motion. Preferably the matrix is such as to retain the seeds in the suspension, for example it may be a gel, paste or viscous fluid. The term "fluid" is used herein somewhat loosely to include a material capable of being readily caused to flow by the application of pressure. The matrix should be of sufficient viscosity to ensure that the seeds remain suspended in it, or non-viscous but of approximately the same specific gravity as the seeds. The seeds then have little tendency to rise or sink.

Perferably the matrix is an aqueous medium, so that a seed surrounded by a small portion of the matrix in the ground can draw moisture direct from the matrix without having to draw moisture from the soil in the early stages of germination and without needing to be in sufficiently close contact with the ground to enable it to obtain the required moisture from it. Moreover the matrix may carry various additives such, for example, as fertilizers, insecticides, fungicides, bactericides, bird repellants or inoculants to cause leguminous plants to form bacterial nodules which fix atmospheric nitrogen. Again, the matrix may include chemicals to prevent seed dormancy.

According to a further aspect of the invention a machine for sowing seeds includes a vehicle adapted to travel over the ground and having means for delivering into the ground a fluid matrix having the seeds disseminated through it. The machine may include means for applying pressure to the matrix to deliver it.

In such a machine the seed and the matrix may be mixed beforehand, together with any nutrient or other additives, and contained in a single container. If the container rotates with a wheel or roller it will help to keep the seed suspended uniformly in the matrix. Alternatively, the machine may embody separate containers either for the seed and the mixture of matrix and additives, or for the seed, the matrix, and the additives separately. In the latter case the machine will be provided with means for mixing the seed with the matrix or with the matrix and additives.

Various forms of machine may be employed for carrying the invention into practice but one specific embodiment will be described by way of example with reference to the accompanying drawing which is a diagrammatic side elevation of a machine for sowing seeds in accordance with the invention.

The machine comprises a framework 10 supported on wheels 11 which can be adjusted up and down relatively to the framework by a handle 12. The framework is connected by links 13 and 14, pivoted to it at 15, and 16 respectively, to a tractor which holds it upright and pulls it

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along. The framework supports a coulter 20 having in its trailing edge a nozzle for ejection of seed in a fluid matrix. The hollow coulter 20 communicates through a pipe 21 with a pump 22 of the flexible tube squeeze or peristaltic type. This comprises a rubber tube 23 lying in a rigid arcuate guide 24 and acted on by a rotor 25 having a number of lobes or rollers 26 arranged to press the tube flat at points spaced along its length, such points advancing so as to propel the liquid trapped between them in the tube along the tube. The inlet end of the tube communicates with a hopper 30 containing a supply of the fluid matrix with seed disseminated in it.

The angle of the hopper should be such as to ensure delivery of the medium whilst preventing arching and therefore blocking. An included angle of approximately 20° has been found satisfactory.

The frame 10 carries a pair of pivoted trailing arms 31 in which is mounted a roller 32 to press down the soil after the seed has been injected into it.

Accordingly in operation the machine is mounted on the hydraulic linkage of the tractor or is merely towed by a tractor, the rotor 22 of the pump being driven either by a separate drive or from the wheel of the machine.

If necessary an agitator may be provided in the hopper to mix its contents.

In an alternative embodiment, not shown, the machine comprises a series of hollow wheels provided with hollow spikes which successively penetrate a short distance into the ground and are connected to cylinders containing plungers to inject a small portion of the matrix and seed each time the spike penetrates the ground. The spikes may take various forms, for example they may be narrow along the axis but of considerably greater width in a plane at right angles to the axis so as to constitute tines or blades. In the limit they may merge into an annular rib so that the machine resembles a Cambridge roller with holes in each rib through which a small quantity of the matrix and seed is ejected into the little groove formed in the ground by a ridge of the roller. Alternatively a continuous or substantially continuous extrusion of the seed bearing matrix may be laid in the groove.

In a further arrangement the wheels or rollers are provided with solid fingers or nibs each of which collects a drop or lump of the matrix and seed as it passes a feed roller, and therefore forces it into the ground.

In a further arrangement small projectiles of the matrix are propelled, from nozzles travelling over the ground, at sufficiently high velocity to penetrate into the ground.

In any form of machine the roller 32 may be replaced by means such as tines or a harrow to close the soil over any slight holes or furrows, to cover the seed.

It will be appreciated that the details of the machine and its dimensions may vary widely in accordance with requirements and in particular on the size of the seed. In this connection the term "seed" is intended herein to include small bulbs or corms.

Many different materials may also be employed for the matrix. For certain seeds a viscous fluid composed of water and sodium alginate has been found adequate but an aqueous jelly formed with ordinary gelatine has also been found satisfactory.

WHAT WE CLAIM IS :—

1. A composition of matter including seeds which remain disseminated through a fluid matrix whether the matrix is stationary or in motion.

2. A composition of matter comprising seeds in suspension in a matrix in the form of a viscous fluid, a gel or a paste.

3. A composition of matter comprising seeds in suspension in a fluid matrix of which the specific gravity is approximately the same as that of the seeds.

4. A composition as claimed in any one of the preceding claims in which the matrix is an aqueous medium.

5. A composition as claimed in any one of the preceding claims in which the matrix carries additives such as fertilizers, insecticides, fungicides, bactericides, bird repellants or inoculants.

6. A machine for sowing seeds including a vehicle adapted to travel over the ground and having means for delivering into the ground a fluid matrix having seeds disseminated through it.

7. A machine as claimed in Claim 6 having means for applying pressure to the matrix to deliver it.

8. A machine for sowing seeds as specifically described herein with reference to the accompanying drawing.

9. A composition of matter as specifically described herein.

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Agents for the Applicants.

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1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.